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# National Information Centers, Facilities and Services for the Environmental Sciences

It is with some apprehension that I attempt to write a paper on this subject, mainly because the tremendous breadth of the subject defies adequate coverage. In addition, I am sure that even now another "information service" oriented to the needs of "environmentalists"—scientists, engineers, researchers, teachers, students, or concerned citizens—is being announced and promoted. I will use the term "environmentalist" to cover the range of people involved in the theme of this Institute.

To adequately cover this topic would have necessitated many months of extensive research and study. I will only cover the major or principal activities, and will limit myself to national, governmental and "not-for-profit" activities. Even with this limitation, it is a little like finding one end of a skein of yarn and not knowing where it goes or where it may end. Fortunately, others have done considerable work in the area and I will refer to them.

## ENGINEERING INDEX

### Background

Let me first cover my own organization, Engineering Index, Inc., because it is the one with which I am most familiar. EI is strictly engineering oriented, but is transdisciplinary in its coverage. If one is interested in the engineering aspects of the environment and the application of engineering methodology to its improvement and control, then EI is probably the best place to look—certainly the first place. EI does not cover federal, state or municipal statutes or laws, with the exception of boiler codes. It does not scan the *Wall Street*

*Journal*, the *New York Times, Newsweek, Forbes, Fortune*, etc., nor does it cover proposed legislation introduced into U.S. or state congressional bodies. In short, EI is not a "newsletter" type of service; it is a most useful index to the world's primary sources of the technical engineering aspects of the environmental sciences.

EI has been in business since 1884 serving the informational needs of the engineering community. Daily, throughout the world, technical information is produced and published in vast quantities, from knowledge and experience generated by individual engineers, scientists, governmental agencies and universities, as well as industry. This information includes the methods, results, tabulations, conclusions, and applications of research, reported in many ways: e.g., a paper may be read at a conference, an article may be published by a professional society, or a book may be written. The sources are so numerous that it is virtually impossible for anyone, whether he is making a simple inquiry or doing extensive research, to be informed fully on any given subject.

How, then, does an environmentalist today remain informed of available technical information of last month, last year, or the last decade? How can he search for a specific piece or area of information pertaining to a particular problem without consulting every paper, book, journal, or conference proceeding around the world? Obviously, he cannot perform such a task by himself. But EI and other indexing and abstracting organizations providing similar services make his search possible by providing him with tools for his task.

EI's staff of technical editors, who are also engineers or scientists, read and analyze thousands of articles each year and systematically abstract and index them in order to make them accessible to EI product users. In his search, the user need only scan EI's specialized index to find entries pertinent to his specific concern. Then he may choose selectively those entries which will be most valuable to study in detail. EI enables the environmentalist to find the information he needs; it saves him both time and money and simplifies his task because he need consult only one comprehensive source.

EI is also unique in that it is transdisciplinary. This means that EI alone brings together, in one place and in English, information from all disciplines of engineering from original English and foreign language sources. This is extremely important today when an inquiry is one discipline quite probably entails necessary research from other relevant disciplines as the sophistication of technology constantly accelerates.

While the present deep concern for our environment is relatively new and some information services have captialized on this growing concern, EI has been covering the subjects since its inception. In the 1947 issue of EI entries may be found under air pollution, noise elimination and water pol-

lution. In the 1922 edition, there are entires under air pollution, water pollution, water supply–contamination, and airplane engines–silencers. Even in volume one, covering the 1884-1891 period, there are entries under air, river pollution, and water contamination and pollution. EI notes that in 1884 a city engineer in Providence, R.I. was concerned with the "properties and disposal of manufacturing wastes."

EI's mission then, is the easy transfer of information from the original source to the ultimate user by providing a data base of abstracts or other entries in several different and useful product forms and services. EI is accomplishing this mission by bringing together information products and services in a unified system. Since the informational needs of engineers are constantly changing, product development is going on continuously. Basically, this is being done by creating a data base encompassing an expanding coverage of the literature within EI's scope. Also, by multiple use, this data base is fully and efficiently exploited to generate a broad spectrum of information services and products.

## Issuance of the Data Base

The data base is presented in three different forms for the user's convenience. These include the printed form, machine-readable form and microform.

### PRINTED FORM

*The Annual.* Since 1884, the *Engineering Index Annual* has been a unique, cumulative record of the preceding year's worldwide engineering literature. It has long been the standard reference for retrospective search of the technological literature housed in the libraries of many nations. The 1971 four-volume set, with more than 5,400 pages, contains 85,000 abstracts and items arranged under 12,000 main subject headings and subheadings, liberally cross-referenced, and has an author index of 137,800 authors. Each *Annual* contains all the abstracts and items published in the twelve monthly issues of the preceding year in the *Engineering Index Monthly*.

*The Monthly*. Since its introduction in 1962, the *Engineering Index Monthly* has been the only printed English monthly service covering the worldwide engineering spectrum. 1972 issues average more than 7,000 abstracts and items, annually covering some 3,500 publications–journals, transactions, proceedings of conferences and symposia, etc. Quick access to the abstracts and notations of content is provided by main headings and subheadings which are cross-referenced to enable the user to locate rapidly the abstracts or titles pertinent to his search. A computer-generated author index gives reference to page and abstract numbers of articles by persons known to the user.

*CARD-A-LERT*. Each week, *CARD-A-LERT* provides the user with a

preselected group or groups of 3 by 5 index cards that contain specialized, up-to-date abstracts pertinent to his particular area of interest. *CARD-A-LERT,* and its predecessor, the Engineering Index Card Service, have provided engineers with selective dissemination of information and current awareness since 1928–long before these terms or concepts came into popular usage. *CARD-A-LERT* is available in a wide selection of 6 disciplines, 38 groups, and 171 divisions of engineering information.

There are four primary divisions in EI's *CARD-A-LERT* system which are directly germane to environmentalists. These, with their approximate card production in 1971 are shown in table 1.

In addition there are thirteen other divisions which might contain information of interest to environmentalists. These, with their approximate card production in 1971, are shown in table 2.

The two groups shown in tables 1 and 2 total 9,995 items, approximately 12 percent of the total data base of 85,000. One-third are directly pertinent to environmental studies. In the case of the other two-thirds, some percentage would be relevant and only an exhaustive study by environmentalists involved in every aspect of the disciplines concerned would be able to ascertain the actual relevance factor.

To date EI has not issued a subset of its data base to serve the unique information needs of the environmental information seeker, except in the *CARD-A-LERT* format. We are currently considering the possibility and potential marketability of such a subset. In this regard it must also be said that EI has not issued any other subset of its data base. Our recent conversion to a computerized, photocomposition production system provides us with the capability to do this much more easily than was possible previously.

## MACHINE-READABLE FORM

*Compendex. Comp*uterized *En*gineering In*dex* makes available, in machine-readable monthly computer tapes, the entire EI data base beginning with January 1969. These tapes are designed for rapid current awareness with automatic retrieval by computer scanning of all abstracts and items contained on the tapes. The computer can retrieve pertinent abstracts, items, or bibliographic references from current or back numbers (retrospective search) of the *Compendex* tapes in response to the specific information needs of users. Various information centers around the world provide search services for the machine-readable data base in close cooperation with EI, some of which are listed in appendix A.

## MICROFORM

*Microfilm Edition.* The entire file of EI is available on microfilm. This file, with its annual additions, provides in a compact, easily accessible form, a

| *Division No.* | *Title* | *Approx. No. of Cards, 1971* |
|---|---|---|
| 451 | Air Pollution | 900 |
| 452 | Sewage and Industrial Wastes Treatment | 625 |
| 453 | Water Pollution | 600 |
| 741 | Acoustics, Noise, Sound | 1600 |

**Table 1. Divisions of EI's *CARD-A-LERT* System of Special Interest to Environmentalists**

| *Division No.* | *Title* | *Approx. No. of Cards, 1971* |
|---|---|---|
| 403 | Urban and Regional Planning | 235 |
| 442 | Flood Control, Land Reclamation | 200 |
| 444 | Water Resources | 530 |
| 445 | Water Treatment, General and Industrial | 580 |
| 446 | Waterworks | 200 |
| 522 | Gas Fuels | 550 |
| 523 | Liquid Fuels | 250 |
| 524 | Solid Fuels | 400 |
| 611 | Hydro & Tidal Power Plants | 225 |
| 642 | Industrial Furnaces and Process Heating | 350 |
| 753 | Sound Technology & Ultrasonics | 400 |
| 912 | Industrial Engineering & Management | 1150 |
| 914 | Safety Engineering | 1200 |

**Table 2. Other Divisions of EI's *CARD-A-LERT* System**

complete, cumulative record of the world's pertinent engineering literature dating from 1884. At the end of 1971, this file comprised nearly 1,700,000 items, more than 99 percent of which include abstracts. A comprehensive ten-year cumulative subject heading/page designation oriented index is available, in both micro and bound-volume formats. Covering the years 1961 through 1970, it is a most valuable retrospective search tool for both the micro-edition and the bound volumes of the *Engineering Index Annual*.

## Concurrent Bibliographic Services

*Publications Indexed for Engineering (PIE).* This lists the journals and certain other serial publications abstracted and indexed selectively for each calendar year; it is published in the *Engineering Index Annual* of that year and as a separate publication. In addition to the alphabetical listing of each publication, the following are also included: CODEN; American National Standard Insti-

tute abbreviation; and the type of editorial review given to it—complete, partial, or monitored coverage.

*Subject Headings for Engineering (SHE).* This is the published authority list of over 12,000 main headings and subheadings used for in-depth alphabetical subject indexing of EI's data base. This authority list or controlled vocabulary is available as a reference, indexing and classification tool and is published to aid in the development of literature search profiles, to identify the *CARD-A-LERT* division codes to which subjects are assigned, and to provide an overview of the subject structure of the EI information services. The list undergoes constant revision and is republished after each significant revision.[1]

## CHEMICAL ABSTRACTS SERVICE

The following information on CAS coverage of ecological and environmental matters is from a letter from Ralph E. O'Dette, senior staff advisor of CAS.

Of the eighty sections of *Chemical Abstracts*, three are wholly concerned with the science and technology of the environment or its pollution. These are: Section 59—Air Pollution and Industrial Hygiene, Section 60—Sewage and Waste, and Section 61—Water. In the first half of 1972 (*CA*, Vol. 76) these three sections carried a total of 3,700 abstracts of which almost 3,100 were journal articles, 500 patents, and the balance books. Coincidentally, the three sections were nearly equal in size.

In addition, seven other sections may contain abstracts of documents pertinent to environmental science and technology. These are: Section 4—Agrochemicals (pesticides and plant growth regulators), Section 5—Toxicology, Section 19—Fertilizers, Soils, and Plant Nutrition, Section 46—Surface-Active Agents and Detergents, Section 50—Propellants and Explosives, Section 51—Petroleum, Petroleum Derivatives, and Related Products, and Section 52—Coal and Coal Derivatives. Abstracts are placed in these sections on the basis of major subject emphasis, but there may be considerable peripheral interest to the environmentalist. Access to the citations of interest in these sections may be gained through cross-references found at the end of each section, the keyword subject index published with each issue of *CA*, search of the *CA* volume indexes, or search of appropriate machine-readable files.

Exact figures on the number of abstracts of interest to environmental science and technology in these sections are not available, but it is felt that there are at least 5,000-7,000 such citations annually.[2]

The following is extracted from a *CAS* brochure entitled "Information System."[3] I include these comments because they reflect the present trend in the information industry towards satisfying information needs by combining

several separate services or products to create a data base of greatly expanded coverage, with resultant increased customer satisfaction with the services provided. While I am not projecting the demise of the 3 by 5 catalog card with the hole in the bottom, we must recognize that it is no longer the sole tool available to the information seeker.

The Chemical Abstract Service Information System is a group of related chemical information services that provides a user with the opportunity to devise an information retrieval program that best suits his particular information needs, work situations and facilities.

The components of the system are:

*Chemical Abstracts*
*CA Sections Groupings*
*CA Condensates*
*CA Integrated Subject File*
*Chemical-Biological Activities*
*Polymer Science and technology*
*Chemical Abstracts on Microfilm*
*Chemical Titles*
*Patent Concordance and Special Indexes to Chemical Abstracts*
*Chemical Abstracts Service Source Index and Quarterly*

Properly employed, the CAS Information System is a powerful vehicle for information retrieval. While a single CAS service is often used most effectively as the data base from which chemical information services are derived, it is when several system components are employed concurrently that the full potential of the CAS Information System may be realized.[3]

## BIOSCIENCES INFORMATION SERVICE (BIOSIS)– ENVIRONMENTAL INFORMATION SERVICES

The following information was obtained at the recent National Environmental Information Symposium in Cincinnati, Ohio. It is included here as the best description available of BIOSIS's contribution to this topic.

BIOSIS (BioScience Information Service of *Biological Abstracts*) provides computerized retrieval services as well as printed information products in all fields of biology, biomedicine, and biochemistry. Especially relevant to the researcher in the environmental sciences are the following information services:

1. *Abstracts on Health Effects of Environmental Pollutants* is a monthly abstracts journal created by BIOSIS in response to the critical needs of scientists today for current information on environmental pollution. The new publication is comprised of selected material from BIOSIS and MEDLARS of the National Library of Medicine. Each issue contains bibliographic information on approximately 1,000 research articles and includes author, subject, and cross indexes in a format similar to that used in *Biological Abstracts*. The reference materials included in *Abstracts on Health Effects of Environmental Pollutants* cover the following:

Occupational health and industrial medicine.
Chemicals or substances in the environment with emphasis on their effects on human health.
General reviews and original papers reporting potentially harmful effects of pollutants on humans.
Studies of lower vertebrates used as indicators of the substances toxic to man; and vertebrates and invertebrates as vectors in the food chain.
Reports of analytical methods for examining biological tissues or fluids.

2. BIOSIS also has a series of very highly specialized abstracts publications, several of which relate to the environmental disciplines:
*Bioresearch Today–Environmental Pollution*
*Bioresearch Today–Human Ecology*
*Bioresearch Today–Food Additives and Residues*
*Bioresearch Today–Pesticides*
*Bioresearch Today–Industrial Health and Toxicology*
Each of the titles in this series contains between 100 and 200 abstracts per month.

3. *Retrospective Search Service*
Using a data base which includes about 1.8 million items from roughly 8,000 serial publications, BIOSIS can perform a comprehensive computerized literature search covering the last decade, 1960 through 1971. All through the search process, the unique nature of the particular information problem is kept in mind. A trained biologist oversees the search procedure to insure accurate and complete results.

4. *Current Literature Alerting Search Service–C.L.A.S.S.*
C.L.A.S.S. is a current-awareness service which regularly and automatically delivers a listing of articles, conference papers, books, and so on, which are specifically relevant to the individual scientist. Our computer stores his "profile," which is an outline of his special interest area, and matches this profile against the 36 yearly additions to the BIOSIS data bank. In this way, the researcher receives a personalized guide to the world's life sciences literature.

5. *Standard Profile Service*
The building of the machine-readable data base at BIOSIS provides the opportunity for the creation of an entire family of computerized services for the researcher. The latest of these, Standard Profiles, is designed in the same format as C.L.A.S.S., our Current Literature Alerting Search Service. The structure is the same. The service Standard Profiles differs from the individualized C.L.A.S.S. in that the profile used for the search is drawn to respond to a topic tht would interest more than one scientist.
The advantages of subscribing to one or more Standard Profiles are two-fold: (a) an immediate service can be provided which avoids the sometimes complex and time-consuming process of designing a custom profile; and (b) the service can be offered at a lower price. The Standard Profiles currently available in the environmental sciences field are the following:

*Air Pollution*
*Biometeorolgy and Bioclimatology*
*Herbicides*
*Monitoring of Environmental Pollution*
*Pesticide Residues in Foods*
*Physiological Effects of Sound*
*Reclamation of Waste Materials*
*Sewage Disposal and Sanitary Measures*
*Pesticide Residues in Soil*[4]

Descriptive brochures for all of the above services may be obtained from BIOSIS. Figure 1 is a pollution-environmental biology subject profile, which shows the tremendous inter-relationships that exist in the subject area under consideration.

## NATIONAL TECHNICAL INFORMATION SERVICE (NTIS)

In its *Weekly Government Abstracts* service, NTIS issues an "Environmental Pollution and Control" publication. NTIS is a U.S. Department of Commerce activity. Publications cited are produced by U.S. government agencies and by leading private individuals and organizations on federal grants and contracts. Publications are announced from more than 225 federal sources including the EPA, Soil Conservation Service, Office of Saline Water, TVA, Federal Power Commission, Forest Service, National Industrial Pollution Control Council, U.S. Departments of the Navy, Agriculture, Housing and Urban Development, Army Corps of Engineers, Federal Highway Commission, Federal Aviation Service, General Services Administration, and many more.

NTIS also publishes and distributes most of the full texts of the material it abstracts and announces. Each item includes the price of the full-scale document and the microfiche edition, if available. Further information on this and other NTIS services may be obtained from NTIS, U.S. Department of Commerce, Springfield, Virginia 22151.

## AMERICAN PETROLEUM INSTITUTE (API)

API publishes *Abstracts of Air and Water Conservation Literature* weekly. Further information on this and other API services may be obtained from API, 1271 Avenue of the Americas, Room 795, New York, N.Y. 10020.

## ENVIRONMENTAL PROTECTION AGENCY

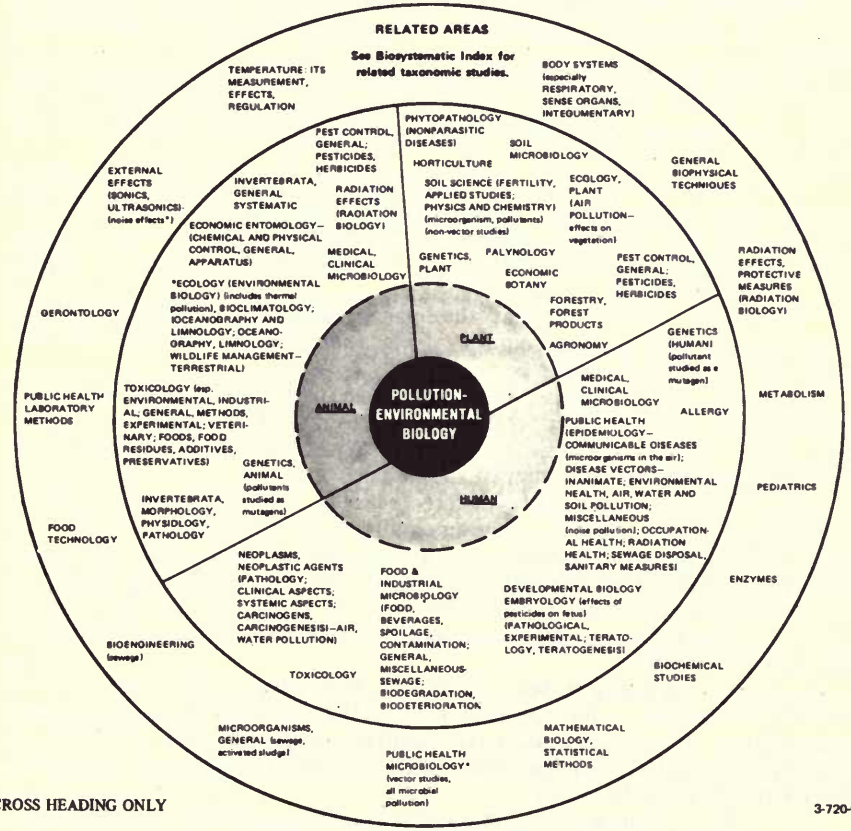
Sarah Thomas covered the activities of this agency in her paper for this Institute, so I will not discuss it. I will just mention one excellent brochure

# POLLUTION-ENVIRONMENTAL BIOLOGY

## SUBJECT PROFILE

**SCOPE OF POLLUTION–ENVIRONMENTAL BIOLOGY RESEARCH IN BIOLOGICAL ABSTRACTS AND BIORESEARCH INDEX**

• BIOSIS 1971 COVERAGE OF POLLUTION-ENVIRONMENTAL BIOLOGY INCLUDES 2,505 REPORTS SELECTED FROM SOME 7600 JOURNALS IN 100 COUNTRIES. • THIS SUBJECT PROFILE DEFINES THE SCOPE OF CURRENT PUBLISHED RESEARCH IN MAJOR AREAS OF POLLUTION-ENVIRONMENTAL BIOLOGY TO FACILITATE SEARCHES OF BIOLOGICAL ABSTRACTS AND BIORESEARCH INDEX IN THIS FIELD. IT SHOULD BE USED WITH THE GUIDE TO THE INDEXES AND THE SUBJECTS CLASSIFICATION OUTLINE, BOTH AVAILABLE UPON REQUEST FROM BIOSIS. • SEGMENTED DIVISIONS ARE ACCORDING TO BROAD FIELDS AND ALSO GENERAL GROUPINGS FOR THOSE HEADINGS IMPORTANT TO EACH SUBDIVISION. THE OUTER CIRCLE LISTS THOSE HEADINGS TO WHICH THESE REPORTS ARE FREQUENTLY CROSS-REFERENCED.




BIOSCIENCES INFORMATION SERVICE, 2100 ARCH ST., PHILA., PA. 19103, U.S.A.

Figure 1

published by the EPA in September 1972 entitled *Directory of Information Sources*. This twelve-page booklet lists fifty information sources, giving the subject matter each covers, its address, contact by name and phone number, and services provided. As a guide to EPA information sources it is a most valuable addition to a "source" collection.[5]

## ENVIRONMENTAL INFORMATION SYSTEM

The following description is from *Scientific Information Notes.*

The National Science Foundation and Oak Ridge National Laboratory are organizing a national environmental information network which could become the prime U.S. system for data on ecological and antipollution activities.

The Oak Ridge Environmental Information System Office is made up of several specialized information centers, or project support centers, and a variety of specialized data bases operating on local, national and international levels.

The centers are largely information-oriented, rather than document-oriented. Each is "imbedded" in an ongoing research activity, so that the staff includes and interacts with research scientists who presumably have special knowledge of recent research and can assist in evaluating the significance of recent findings.

Oak Ridge points out that the management of each center includes specialists who can answer inquiries from their own knowledge, and can decide how information might be transferred.

As part of this process, the centers can participate in and guide the preparation of state-of-the-art reviews, and can cooperate with other centers for a wider range of synthesis and analysis "thus allowing the system's total effect to be greater than the sum of the parts."

The EISO data base includes 216 federally or commercially sponsored information centers; 1,647 environmentally related research projects and project leaders located throughout the world, and names of Oak Ridge staff members involved in environmental research. The base is growing rapidly as new projects and programs are located.

a. The following ORNL centers are now part of the environmental information network:

1. *Ecological Sciences Information Center (ESIC)*–Designed to provide bibliographic reference data relevant to the movement, cycling and concentration of elements, isotopes, natural compounds and pollutants in different ecosystems. Contains over 3,000 selected references on terrestrial, freshwater and marine ecology.

2. *Environmental Mutagens Information Center (EMIC)*–Collects and disseminates information on genetic effects of drugs, food additives, cosmetics and industrial chemicals, with a data bank containing over 5,000 items.

3. *Eastern Deciduous Forest Biome Information Center*–This center was established in connection with the International Biological Program. Its major functions include computer storage, retrieval and analysis of

numerical data collected at the five sites within the biome—including meteorological, primary and secondary productivity, phenological and hydrological data—and bibliographic material concerning baseline ecological parameters. The center plans to publish an abstract journal for all IBP publications and data sets.

4. *Toxicology Information and Response Center*—Originally established as an arm of the National Library of Medicine. The initial emphasis will be on the capability to respond to questions on the toxicity of pesticides and other chemicals in the environment.

b. The following data bases are under development:

1. *Toxic Materials in the Environment*—References on arsenic, beryllium, cadmium, chromium, copper, fluorine, lead, manganese, mercury, molybdenum, nickel and zinc. Areas covered are natural occurrence, mining and extraction; uses and consumption; waste disposal, pollution sources and pollution; analytical methods and monitoring equipment; control, abatement and restoration; legal and political aspects; physiological and toxicological aspects; and biotransformation and ecosystem movement.

2. *Social Sciences Data Base*—Statistical data from the 1970 census on population and housing, as well as other sources on employment, business patterns and migration for state economic areas.

3. *Regional Modeling Data Base*—Includes approximately 2,000 abstracts on the development and use of mathematical models capable of simulating the economic, societal, ecological and land use responses of a geographical region to alternative policy decisions. This data base can also be used for technology assessment studies.

4. *Energy Data Base*—Major emphasis in this program is on material relating to stationary sources and electric power plants in particular. EISO has also been developing an inventory of research and development in virtually all energy fields, including power, heating and transportation using such sources as fossil fuels, nuclear, hydro-electric, solar radiation, geothermal. Problems concerning exploration, mining, refining, conversion and distribution of energy resources are covered. The inventory was recently made available.[6]

5. *Material Resources and Recycling Data Base*—Materials of interest include paper, glass, coal, asbestos, rubber, plastics, fly ash and pesticides. Major emphasis is on solid waste management, including collection, transfer, disposal and recycle potential.

c. EISO can also employ other data bases for batch searches. These include:

1. *Air Pollution Technical Information Center*—Approximately 3,500 items on 13 toxic elements.

2. *Tamplin-Gofman Data Base*—Contains over 10,500 items on radioisotope movement in natural food chains, and radionuclide cycling in the environment.

3. *Air Force*—Over 625,000 references in the fields of physical science and technology selected from foreign literature for the Central Information Reference and Control System, Wright-Patterson AFB, Ohio.

4. *EPA Data Collections*—Including Water Quality Office project summaries and literature on oil and hazardous materials, marine biology, solid wastes and industrial wastes.

d. *Directory Services*—The computerized directory of information

centers, research projects and individual investigators is designed to form the first step in automating the linkage of environmental information sources into a national network. Each entry in the directory contains the name, address and telephone number of an individual, information center, or research organization, and includes a brief text describing the mission, subject, scope and sponsor. For individuals, descriptions include professional work specialties, available skills and even special interests, such as hobbies and community activities. Output of the system can include address labels, address, abstract and keyword information, in various formats.[7]

## SOME ADDITIONAL SERVICES

### RECYCLING INFORMATION SERVICE

A solid waste recycling information service, providing guidance to state, municipal and county officials involved in solid waste management and environmental problems, has been established by the National Association of Secondary Material Industries. The service provides general and technical data on current trends in recycling and developments in solid waste utilization processes, marketing opportunities information, engineering and technological advice, and counsel on the implementation of local legislation for waste recycling. (Requests for information should be addressed to NASMI, Solid Waste Recycling Information Service, 330 Madison Ave., New York, N.Y. 10017).[8]

### STATE ENVIRONMENT DATA

A management system designed to provide environmental information to state legislators is being developed for the State of Louisiana by North American Rockwell Information Systems Company. The comprehensive statewide system is expected to combine various environmental factors such as air quality, water quality, pesticide usage and land use. The goal is to provide decision-makers with "a better understanding of the relationships that exist between these factors and how the total environment will be affected by proposed actions."[8]

### WATER RESOURCES RESEARCH CENTER

This activity recently published a technical report on *A Survey of Indexing and Abstracting Services for Water Resources Engineers*,[9] which is an excellent coverage of this topic.

By this time the reader of this volume is well aware that there is no lack of information or services oriented to the needs of the environmentalist. (Appendix B contains a list of secondary publications and appendix C a list of secondary sources.) The next question is: Which ones are for me? Each person must answer that question alone. Maybe, though, I can help just a bit.

No individual, special library, university department or citizens group could afford to subscribe to all the newsletters, directories, reference books, primary journals, and secondary publishing services which might contain something of interest to them. Even if an activity could afford to do so the time involved in scanning or reading the mass of paper which would arrive as a result of such action would be prohibitive. What is the answer? First the person or group should take a good hard look at its mission so it can identify the information needs which must be satisfied. When these information needs have been identified, then one must identify the sources of information which will best satisfy the needs. It might be advisible to rank them in "contributing" or "satisfying" order. After this is done the available money is allocated to the services on the list, starting at the top and going down as far as the money lasts. One may end up with two or more lists of sources and then must decide again how far the money will go.

There is one benefit to the above approach. In most cases, subscriptions to information services are on an annual basis; one is committed for only a year at the outset. If, as the year goes by, a service does not live up to expectations or its announced benefits, or if there is a re-orientation of basic mission, the subscription need not be renewed. The money can be used for another service the next year. There is another advantage to establishing a priority list and maintaining it on a current basis: if money gets tight, or if extra funds become available, decisions have already been made on what to cut or add.

One word of caution. I mentioned earlier the increasing "birthrate" of environmentally oriented information services. Some of these never quite make it; they bloom for a short period of time, then the petals fall off, and eventually it is difficult to find the plant itself. So if you have limited funds, invest them wisely, avoiding the here-today-maybe-gone-tomorrow type of service. In addition, on a dollar-for-dollar basis governmental services are best, if they exist and provide the type of coverage required in the area of information which will satisfy your needs.

## REFERENCES

1. *The Organization–The Service*. Engineering Index, Inc., 345 East 47th Street, New York, N.Y. 10017.

2. O'Dette, Ralph E., Senior Staff Advisor, Chemical Abstracts Service. Letter dated Sept. 29, 1972.

3. Chemical Abstracts Service. "Information System." Columbus, Ohio State University.

4. Hogan, Thomas H. "BIOSIS: Environmental Information Services." BIOSIS, 2100 Arch Street, Philadelphia, Pa. 19103.

5. Environmental Protection Agency. *Directory of Information Sources.* Washington, D.C., Management and Organization Division, EPA, Sept. 1972.

6. Report ORNL–EIS072-18, Vols. I and II. Available through AEC/contractor channels or a $9.00 for Vol. I and $6.00 for Vol. II from NTIS, U.S. Dept. of Commerce, Springfield, Va. 22151.

7. *Scientific Information Notes.* Trends Publishing, Inc., National Press Bldg., Washington, D.C., 4:3-6, no. 2, 1972.

8. *Ibid.*, 4:16, no. 3, 1972.

9. Wellisch, Hans (Hanan). *A Survey of Indexing and Abstracting Services for Water Resources Engineers* (Water Resources Research Center Technical Report, no. 11). College Park, Md., University of Maryland, School of Library and Information Service.

## APPENDIX A
## PARTIAL LIST OF COMPENDEX INFORMATION DISSEMINATION CENTERS

Univ. Systems of Georgia
Computer Center
Univ. of Georgia
Athens, Ga. 30601
Attn: John Gibson

ITT Research Institute
3441 S. Federal St.
Chicago, Ill. 60616
Attn: Peter Schipma

Center for Information Science
Mart Library
Lehigh University
Bethlehem, Pa. 18015
Attn: Larry Davis

National Research Council of Canada
National Science Library
Ottawa 7, CANADA
Attn: Georg R. Mauerhoff

Royal Institute of Technology Library
Postadress 10044
Stockholm 70, Sweden
Attn: Zofia Bluchowicz

United States Dept. of Agriculture
Cultural Research Service
Plant Industry Station
Beltsville, Md. 20705
Attn: Tommy Cooper

National Agriculture Library
Data Systems Division

Xerox Education Group
University Microfilms
200 North Zeeb Road
Ann Arbor, Mich. 48103
Attn: Linda White

## APPENDIX B
## LIST OF SECONDARY PUBLICATIONS

*Air Pollution Title*
Center for Air Environment Studies
226 Chemical Engineering II
Pennsylvania State University
University Park, Pa. 16802

*Air Quality Control Digest*
University Digest Services
P. O. Box 343
Troy, Michigan 48084

*Analytical Abstracts*
Mrs. H. I. Fixk, Ed.
9-10 Saville Row
London W1X 1AF, England

*BCURA Gazette*
British Coal Utilization Research
Association Information Service
Randalls Road
Surrey, England

*Central Electricity Generating Board Digest*
Sudbury House
15 Newgate street
London, EC1, England

*Chemical Abstracts*
Chemical Abstract Service
Ohio State University
Columbus, Ohio 43210

*Engineering Index CARD-A-LERT*
Engineering Index, Inc.
345 East 47th St.
New York, N.Y. 10017

*Environment Information ACCESS (Air Pollution Category)*
Environment Information Center, Inc.
124 East 39th St.
New York, N. Y. 10016

*Fluoride Abstracts*
Kettering Laboratory
Dept. of Environmental Health
College of Medicine
University of Cincinnati
Cincinnati, Ohio

*Fuel Abstracts*
Institute of Fuel
18 Devonshire Street
London, W1N 2AU, England

*Government Reports Announcements*
National Technical Information Service
Springfield, Va. 22151

*Graphic Arts Abstracts*
Graphic Arts Technical Foundation
4615 Forbes Avenue
Pittsburgh, Pa. 15213

*Index MEDICUS*
National Library of Medicine
8600 Rockville Park
Bethesda, Md. 20014

*Institute of Petroleum Abstracts*
Institute of Petroleum Abstracts
61 New Cavendish Street
London, W1M 8AR, England

*Lead Abstracts*
Lead Development Association
34 Berkeley Square
London, W1, England

*Monthly Catalog of U.S. Government Publications*
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

*Motor Industry Research Association*
Automobile Abstracts
Motor Industry Research Association
Lindley, Near Nuneaton
Warwickshire, England

*National Coal Board Abstracts*
Hobart House
Grosvenor Place
London SW1, England

*Occupational Safety and Health Abstracts*
International Occupational Safety and Health Information Center
International Labor Office
Geneva 22, Switzerland

*Physics Abstracts*
Institute of Electrical and Electronics Engineers, Inc.
345 East 47th St.
New York, New York 10017

*Pollution Atmospherique*
Pollution Atmospherique
21 Rue Murillo
Paris, France

*STAR*
National Aeronautics and Space Administration
Scientific and Technical Information Division
Washington, D.C. 20546

*Zinc Abstracts*
Zinc Development Association
34 Berkeley Square
London W1, England

Source: Environmental Protection Agency. Request for Proposal on "Screening, Cataloging, Abstracting and Indexing of Air Pollution Technical Literature." April 14, 1972.

## APPENDIX C
## LIST OF SECONDARY SOURCES

*GRA* (NTIS)
*STAR* (NASA)
*Pollution Abstracts*
*Air Pollution Titles*
*Engineering Index*
*Index MEDICUS*
*Chemical Abstracts*
(National Clearinghouse on) *Smoking and Health Bulletin*
*Zinc Abstracts*
*Graphic Arts Abstracts*
*Monthly Catalog of U.S. Government Publications*
*Environment Information ACCESS*
*Abstracts of Air and Water Conservation Literature and Patents* (Am. Petrol. Inst.)
*Lead Abstracts* (Kettering)
*Fluoride Abstracts*
*Air Quality Control Digest*
*Analytical Abstracts*
*Central Electricity Generating Board Digest*
*Occupational Safety and Health Abstracts*
*Fuel Abstracts*
*Physics Abstracts*
*Motor Industry Research Association Automobile Abstracts*
*OCTEL Exhaust Gas Air Pollution Abstracts*
*National Coal Board Abstracts*
*Institute of Petroleum Abstracts*
*AIAA Bulletin* (American Institute of Aeronautics and Astronautics)
*BCURA Monthly Bulletin*
Institute of Paper Chemistry Abstracts

Source: Environmental Protection Agency. Request for Proposal on "Screening, Cataloging, Abstracting and Indexing of Air Pollution Technical Literature." April 14, 1972.